

SWBAT: describe the doppler effect

Jan 4-7:20 AM

Concept Sheet

~ 7 rows when we're done...

We'll fill in two terms (rows) today.

Concept	Meaning	Sym-bol	Units	Picture
FREQUENCY	HOW MANY PER UNIT OF TIME $\text{FREQ} = \frac{\#}{\text{TIME}}$	$f$ $f = \frac{1}{T}$	hertz $\text{Hz} = \frac{1}{\text{sec}}$	
PERIOD	HOW MUCH TIME FOR ONE. PERIOD = $\frac{\text{TIME}}{\#}$	$T$ $T = \frac{1}{f}$	seconds sec.	
TRANSVERSE	WHEN THE MEDIUM VIBRATES ACROSS THE DIRECTION THE WAVE TRAVELS.			
LONGITUDINAL	WHEN THE MEDIUM VIBRATES ALONG THE DIRECTION THE WAVE TRAVELS.			
AMPLITUDE	HOW FAR FROM THE MIDDLE.	$A$	meters m	
WAVELENGTH	HOW FAR FOR ONE "BACK & FORTH"	$\lambda$	meters m	
WAVE SPEED	DISTANCE OF A WAVE / TIME OF A WAVE	$v$	meters/second m/s	

Feb 18-6:50 AM

# Welcome!!!

SECA Physics  
Friday 25 April 2014

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\* Pick up:

- white board, eraser, marker
- blue concept sheet
- slip of paper (for later)

## Opening Questions:

Ever heard of the Doppler Effect? How would you describe it?

Centering

Sep 7-7:04 AM

Volunteer: Say "Hi"  
Louder / quieter  
Higher / Lower

Train whistles:

[http://www.youtube.com/watch?v=i6Hno\\_u8FHg](http://www.youtube.com/watch?v=i6Hno_u8FHg)

<http://www.youtube.com/watch?v=8PpQcDNgGzM>

Fire trucks:

<http://www.youtube.com/watch?v=imoxDcn2Sgo>

What's happening (BESIDES louder and quieter)???

SOUND GOT LOWER PITCH  
DEEPER

WHEN IT PASSED

Where else do we see this?

POLICE CARS, AMBULANCE, RACE CAR

Feb 11-8:46 AM

**DOPPLER EFFECT:**

Frequency changes when the source and observer move compared to each other!

WHY???

<http://lectureonline.cl.msu.edu/~mmp/applist/doppler/d.htm>

What does it look like when the source is standing still?

CIRCLES EXPANDING EQUALLY SPACED

What happens when the source moves (in front and behind)?

EVENLY SPACED CIRCLES EXPANDING  
CLOSE TOGETHER, & SPREAD OUT

<http://astro.unl.edu/classaction/animations/light/dopplershift.html>

What does the observer experience?

SAME WHEN STILL, MORE FREQUENT WHEN TOWARDS

Does it matter which is moving?

NO. TOWARDS  $\Rightarrow$  HIGHER FREQ.

Feb 11-8:49 AM

SOUND: LOUD - AMPLITUDE

CLOSER = LOUDER  
FARTHER = QUIETER } - DEPEND ON DISTANCE

DOPPLER EFFECT

PITCH  $\rightarrow$  FREQUENCY

HOW OFTEN AIR VIBRATES YOUR EAR

DEPENDS ON MOVING

TOWARDS: HIGHER FREQ.  
AWAY: LOWER FREQ.

Apr 25-8:28 AM

Demos:

- My doppler box -- person swinging it doesn't hear much difference?

<http://www.animations.physics.unsw.edu.au/jw/doppler.htm>

Bike rider...

Train app

<http://www.planetseed.com/node/20145>



Feb 11-8:59 AM

# Explain: What is the Doppler Effect?

## Why does it happen?

frequency

waves / vibrations

SENTENCES

wavelength

period

away / towards

Apr 25-7:25 AM

### Daily 3 Questions

- \* Every day except test/project days
- \* 3 Questions on the topics of the day
- \* Main source of daily points
- \* I am happy to give credit when I have no concerns about someone giving or getting help with the answers.

CP: Standing Wave worksheet  
was due!

You can't get your points if you don't have your NAME!!!

Name	Period
1.	
2.	
3.	

Sep 9-7:32 AM

1) What's the name for the effect of a moving sound source?

DOPPLER

2) When a sound source is coming towards you the pitch seems

- ☒ A) higher
- B) lower
- C) about the same

3) What's one place in life you encounter this effect?

POLICE CARS, AMBULANCE, RACE CAR

Apr 25-7:25 AM